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ORIGINAL ARTICLE

Magnetic resonance imaging in detecting female infertility

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ABSTRACT:
Background: The inability of a couple to conceive spontaneously following a year of consistent, unprotected sexual activity is known as infertility. The present study was conducted to assess efficacy of magnetic resonance imaging in detecting female infertility. **Materials & Methods:** 70females age ranged 21-40 years were enrolled. Symptoms including dysmenorrhea and pelvic discomfort was recorded. In the supine position, the patient had an MRI on a 1.5 Tesla machine with a 32 phased-array surface coil. Several anomalies were noted on the MRI. **Results:** Age group 21-25 years had 28, 26-30 years had 12, 31-35 years had 14 and 36-40 years had 16 patients. The difference was non- significant (P< 0.05). The causes of female infertility was tubal disease in 17, endometrial polyps in 23, adenomyosis in 11, PCOS in 9, endometriosis in 3, leiomyoma in 2 and pelvic inflammatory diseasein 5 cases. The difference was significant (P< 0.05). **Conclusion:** A great non-invasive technique for assessing female infertility is magnetic resonance imaging (MRI).
Key words: Endometriosis, infertility, MRI

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INTRODUCTION

The inability of a couple to conceive spontaneously following a year of consistent, unprotected sexual activity is known as infertility.[1] Worldwide, 13–15% of couples are impacted by this clinical entity, which has significant social significance. Of all the common reasons of infertility in women, 30–50% of cases are caused by diseases of the tubules and peritubules, while 30–40% are caused by ovarian disorders.[2]

It is commonly recognized that MR imaging can accurately detect and localize uterine leiomyomas as well as differentiate between congenital uterine abnormalities.[3] The fact that MR imaging does not require ionizing radiation is one of its benefits, and this is particularly significant for women who are fertile. MR imaging also has the advantage of being less invasive and observer reliant than traditional imaging methods.[4] Additionally, new developments in MR imaging with the phased-array coil have opened up new imaging opportunities, leading to multiplanar capabilities, quick procedures, and great spatial and tissue contrast resolution.MRI also detects pathological lesions, including tubal lesions and pituitary adenoma. It helps in predicting the prognosis in conservatively treated cases of leiomyoma, adenomyosis, and endometriosis.[5] The present study was conducted to assess efficacy of magnetic resonance imaging in detecting female infertility.

MATERIALS & METHODS

The present study comprised of 70females age ranged 21-40 years. All enrolled patients gave their consent for participation in the study.

Data such as name, ageetc. was recorded. Symptoms including dysmenorrhea and pelvic discomfort was recorded. An hCG serum test was performed prior to the examinations. In the supine position, the patient had an MRI on a 1.5 Tesla machine with a 32 phased-array surface coil. Several anomalies were noted on the MRI. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Age group (Years)	Number	P value
21-25	28	0.74
26-30	12	
31-35	14	
36-40	16	

Table I, graph I shows thatage group 21-25 years had 28, 26-30 years had 12, 31-35 years had 14 and 36-40 years had 16 patients. The difference was non- significant (P< 0.05).

Graph I Distribution of cases

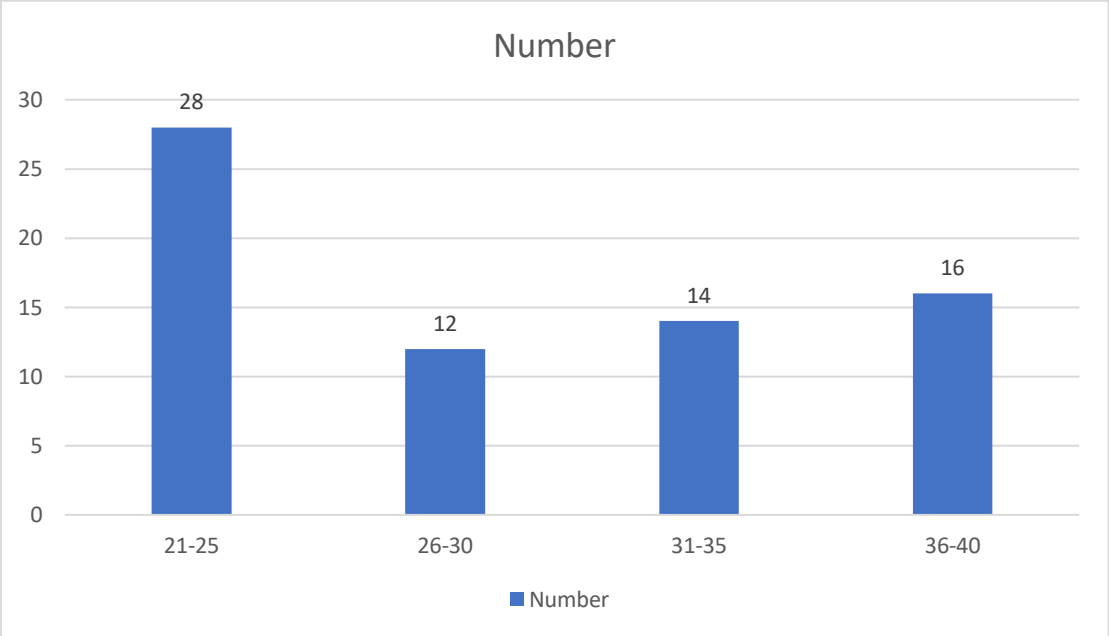
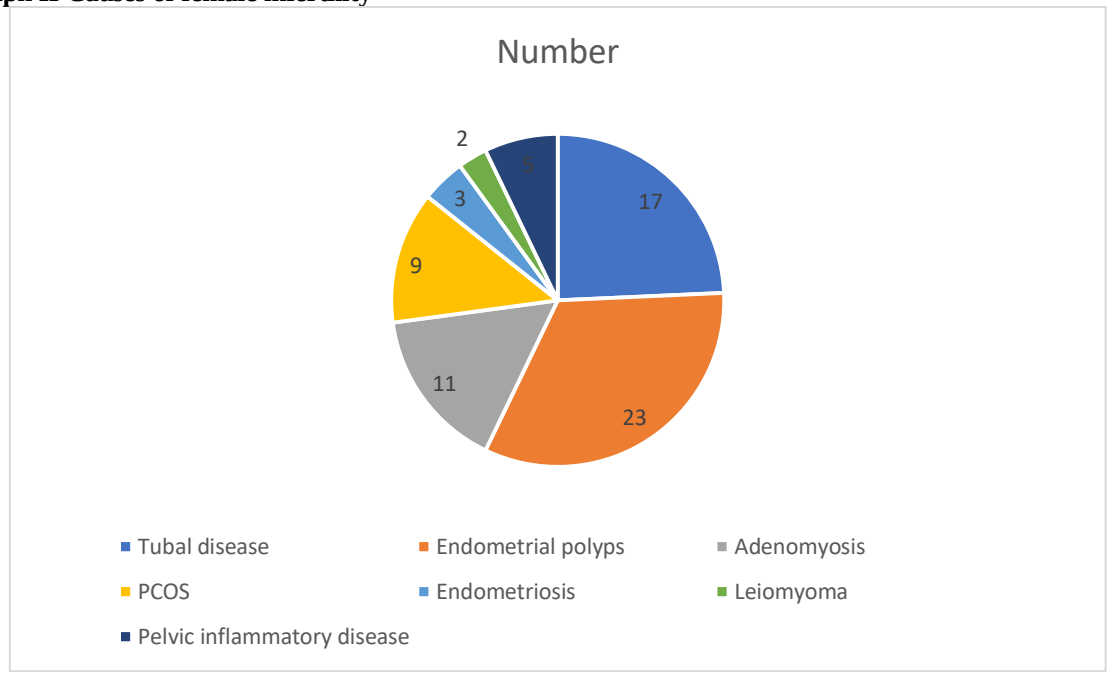


Table II Causes of female infertility

Causes	Number	P value
Tubal disease	17	0.04
Endometrial polyps	23	
Adenomyosis	11	
PCOS	9	
Endometriosis	3	
Leiomyoma	2	
Pelvic inflammatory disease	5	

Table II, graph II shows that causes of female infertility was tubal disease in 17, endometrial polyps in 23, adenomyosis in 11, PCOS in 9,endometriosis in 3, leiomyoma in 2 and pelvic inflammatory disease in 5 cases. The difference was significant (P< 0.05).

Graph II Causes of female infertility



DISCUSSION

One year of unprotected sexual activity without pregnancy is considered infertile. The need for infertility treatments and services has grown in recent years. Currently, the most useful methods for assessing female pelvic problems associated with infertility are laparoscopy, hysteroscopy, and hysterosalpingography.[6] For more than a decade, magnetic resonance imaging (MR) has been utilized to assess issues related to female infertility, even though transvaginal ultrasonography (US) has been the primary imaging modality for evaluating the female genital tract.[7,8] The present study was conducted to assess efficacy of MRI in detecting female infertility.

We found that age group 21-25 years had 28, 26-30 years had 12, 31-35 years had 14 and 36-40 years had 16 patients. Magnetic resonance (MR) imaging has extended the usefulness of imaging in evaluation of pelvic disorders associated with female infertility. The causes of female infertility include ovulatory disorders (ie, pituitary adenoma and polycystic ovarian syndrome), disorders of the fallopian tubes (ie, hydrosalpinx and pelvic inflammatory disease), uterine disorders (ie, müllerian duct anomaly, adenomyosis, and leiomyoma), and pelvic endometriosis. Although laparoscopy, hysteroscopy, hysterosalpingography, and transvaginal ultrasonography are the most effective techniques for evaluation of pelvic disorders related to female infertility, MR imaging is used in a variety of clinical settings in diagnosis, treatment, and management.[9] The applications of MR imaging include evaluation of the functioning uterus and ovaries, visualization of pituitary adenomas, differentiation of müllerian duct anomalies, and accurate noninvasive diagnosis of adenomyosis, leiomyoma, and endometriosis. In addition, MR imaging helps predict the outcome of conservative treatment for adenomyosis, leiomyoma, and endometriosis and may lead to selection of better treatment plans and management. Finally, MR imaging may serve as an adjunct to diagnostic laparoscopy and hysterosalpingography in patients with hydrosalpinx, peritubal adhesions, or pelvic adhesions related to endometriosis.[10]

We observed that causes of female infertility was tubal disease in 17, endometrial polyps in 23, adenomyosis in 11, PCOS in 9, endometriosis in 3, leiomyoma in 2 and pelvic inflammatory disease in 5 cases. MRI is superior to transvaginal ultrasound in terms of sensitivity (95% vs. 81%), specificity (89% vs. 78%), and overall diagnostic accuracy (93% vs. 80%) when it comes to diagnosing pelvic inflammatory illness. These scientists have also come to the conclusion that MRI's improved performance might lessen the requirement for laparoscopies for diagnostic purposes. When tuboovarian abscess is assessed using diffusion-weighted MRI instead of standard MRI sequences, the results reveal improved sensitivity (100% vs. 47.1%), specificity (97.1% vs. 91.4%), positive predictive value (97.1% vs. 84.2%), negative predictive value (100% vs. 64%), and overall accuracy (98.6% vs. 69.6%).[11]A US study on myomectomy-related uterine remodeling showed a progressive reduction in uterine volume over the course of six months, with the most notable alteration happening in the first two to three months following the surgery. The most notable uterine alteration in an MR imaging investigation happened one month following myomectomy and included a decrease in uterine volume with a proportionately normal zonal structure.[12]

MRI is the modality of choice and has a reported accuracy of up to 100% sensitivity and specificity in the evaluation and classification of MDAs.[13,14] MR-based classification systems as proposed by all, the European Society of Human Reproduction and Embryology/European Society for Gynaecological Endoscopy ESHRE/ESGE and those by the American Society for Reproductive Medicine (ASRM) are all currently acceptable. A detailed description of these anomalies are beyond the scope of this article. Few recent reports do cite that 3D ultrasound has similar diagnostic accuracy as MRI in the evaluation of Mullerian ductal anomalies, but the technique however has a limitation in the lack of wide availability of expertise.[15]

CONCLUSION

Authors found that a great non-invasive technique for assessing female infertility is magnetic resonance imaging (MRI).

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